MOTOR VEHICLE TRAFFIC FATALITIES AND INJURIES - 1996
INTERSTATE SYSTEM

	INJURY CRASHES Per 100 million vehicle miles of travel		
	FATAL CRASH RATE	NONFATAL CRASH RATE	FATALITY RATE
MINNESOTA RURAL	0.40	18.88	0.40
NATIONAL AVERAGE	1.03	25.01	1.23
MINNESOTA URBAN	0.35	32.08	0.40
NATIONAL AVERAGE	0.59	38.84	0.66

Source: United States Department of Transportation, Federal Highway Administration, ***Highway Statistics 1996***, PL-98-003.

- Minnesota fatality crash rate:
  - 61 percent below the national average on the rural interstate system
  - 41 percent below the national average on the urban interstate system

- Minnesota nonfatality crash rate:
  - 25 percent below the national average on the rural interstate system
  - 18 percent below the national average on the urban interstate system

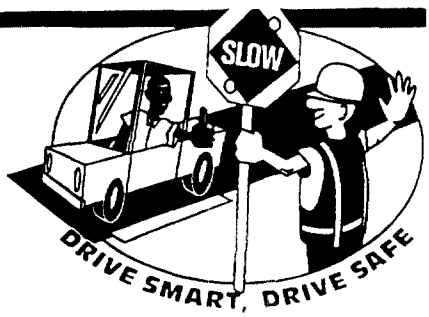
- Minnesota fatality rate:
  - 67 percent below the national average on the rural interstate system
  - 39 percent below the national average on the urban interstate system

MOTOR VEHICLE TRAFFIC FATALITIES AND INJURIES - 1996
NATIONAL HIGHWAY SYSTEM

	INJURY CRASHES Per 100 million vehicle miles of travel		
	FATAL CRASH RATE	NONFATAL CRASH RATE	FATALITY RATE
MINNESOTA RURAL	0.88	28.08	1.17
NATIONAL AVERAGE	1.46	36.30	1.72
MINNESOTA URBAN	0.45	44.12	0.50
NATIONAL AVERAGE	0.82	68.88	0.92

Source: United States Department of Transportation, Federal Highway Administration, ***Highway Statistics 1996***, PL-98-003.

- Minnesota rural fatality crash rate on its portion of the National Highway System is more than double the rate on the Interstate System.
- Minnesota rural nonfatality crash rate on its portion of the National Highway System is more than one third higher than the rate on the Interstate System.
- Minnesota rural fatality rate on its portion of the National Highway System is 66 percent higher than the rate on the Interstate System.



Minnesota Work Zone Traffic Crashes

This report contains the number of crashes reported in marked and unmarked construction, maintenance and utility work zones on all Minnesota streets and highways. This does not include crashes that occurred in snow removal operations.

Between 1993 and 1997 there were 11,536 work zone crashes resulting in:

- 64 fatalities
- 5,559 injuries
- 7,803 property damage accidents; and
- an estimated $221,429,100 in loss

One of the 64 traffic fatalities from 1993 to 1997 was a highway worker. This means that 98 percent of work zone traffic fatalities were drivers, passengers, pedestrians or bicyclists traveling through work zones.

Work Zone Crash History

Figure 1 contains work zone crash costs on all streets and highways in Minnesota from 1993 through 1997. The information is divided into the number of people killed, people injured and damage done to property.

Figure 1 - Reported costs related to work zone crashes - All Minnesota Streets and Highways

Year	People Killed	People Injured	Damage to Property	Estimated Cost
1993	10	1283	1722	$48,780,900
1994	13	977	1509	$40,372,800
1995	10	1056	1453	$41,131,100
1996	14	1244	1769	$48,529,800
1997	17	999	1350	$42,614,500

Figure 1 includes cost estimate using 1997 data from the Minnesota Safety Improvement Program for fatalities, injuries and property loss resulting from traffic crashes. The costs are based on the following values:

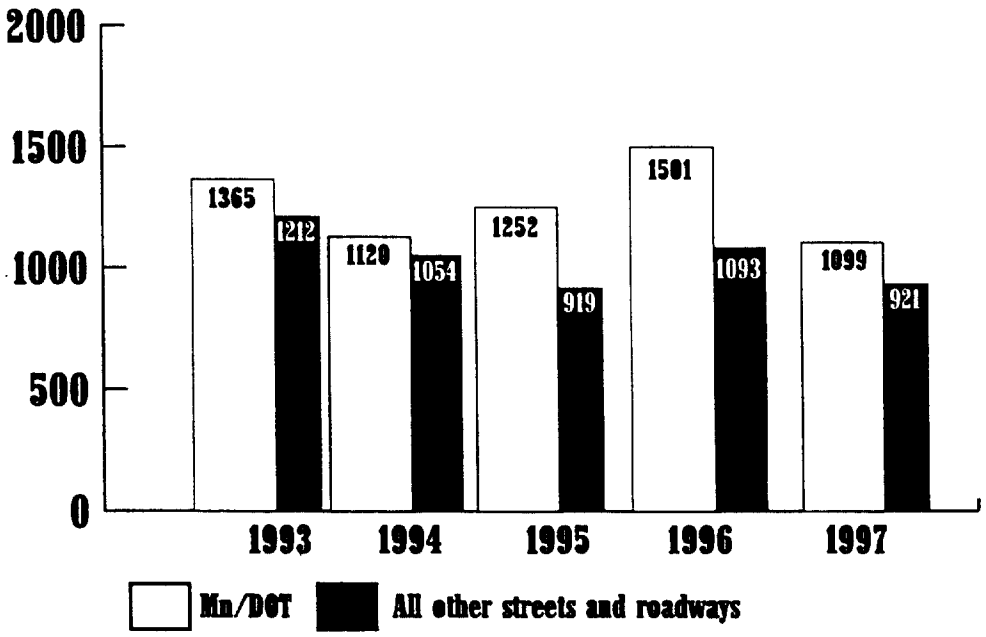
Fatalities at	$500,000.00
Injuries at	$30,500.00
Property Damage Accidents at	$2,700.00

Work Zone Crashes by Highway System

Figure 2 contains work zone crash distribution by highway system. For this analysis the streets and highways were categorized as Mn/DOT and non-Mn/DOT roadways. Mn/DOT roadways include all Interstate, U.S. and Minnesota numbered roadways.

Figure 2 - Work Zone Crashes by Highway Type

	Mn/DOT Roadways				Non-Mn/DOT Roadways				
Year	Fatality Crashes	Injury Crashes	Property Damage Crashes	Total	Fatality Crashes	Injury Crashes	Property Damage Crashes	Total	Total Crashes per Year
1993	6	434	925	1365	4	411	797	1212	2577
1994	6	330	784	1120	5	324	725	1054	2174
1995	6	406	840	1252	4	302	613	919	2171
1996	7	473	1021	1501	6	339	748	1093	2594
1997	11	366	722	1099	4	289	628	921	2020



From 1993 to 1997

- **a 22 percent reduction in the number of work zone crashes on all roadways;**
- **a 19 percent decrease in the number of work zone crashes on Mn/DOT roadways; and**
- **a 24 percent reduction in the number of work zone crashes on non-Mn/DOT roadways.**

German-built cable plows were used on the project; they can lay up to five miles of ducts daily

fiber optics technology, he notes, allows for reliable, high-speed transfer of voice, video and data communications over long distances. Optical fibers are immune to electromagnetic interference and more reliable than standard copper wires. Over 1.13 billion bits of information per second can be transmitted over one pair of fibers. The same two-strand fiber circuit can handle 32,000 simultaneous calls.

Intermedia Communications Inc, IXC Carrier Inc, Qwest Communications Corporation and WorldCom Inc – MFS's parent company – have also leased space on the New York State network.

The agreement

MFS is one of the industry's leading integrators of large-scale networks and specialized systems for communications, transportation and security applications. Clients include federal, state and local government agencies; telecommunications services companies, regional and state transportation and transit agencies, public utilities and private industry both in the USA and abroad.

"MFS assumed all construction and marketing costs, and is entitled to the first $50 million in revenues generated by the network"

"New York is the ideal location for a fiber optic network, considering it is home to some of the largest corporate, financial and industrial entities in the USA," says Steinberg. "The telecommunications services provided by the network will give New York businesses a competitive advantage in the global marketplace."

It did not take long for system users to jump on the new information superhighway. Before ground was even broken, Canada-based fONOROLA Inc. agreed to lease space on 474 miles of the network at a cost of US$11.4 million. The company plans to use 12 strands of the network to connect to an existing switching facility in Buffalo, New York, and to a group of international carriers in New York City.

MFS recently merged with WorldCom, a leading provider of integrated long-distance and local telecommunications service, offering domestic and international voice, data, Internet and video services to business customers, other carriers and the residential marketplace. The company operates a nationwide digital fiber optic network in the USA and has worldwide network capacity.

The agreement with MFS arose from a 1994 report prepared by Palmer Bellevue, an economic consulting firm, which confirmed there was market potential for the network. Later that year, the Authority issued a request for proposals to 125 companies. MFS and Sprint submitted proposals, with MFS winning the contract. Under the agreement, MFS assumed all construction and marketing costs, and is entitled to the first $50 million in revenues generated by the network. The Thruway receives 10 per cent of all revenues between $50 million and $88 million, and 50 per cent of all revenues above $88 million.

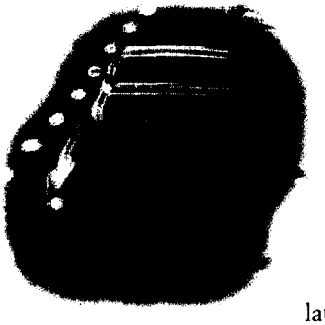
When fully operational, the network is expected to generate more than $100 million in revenues. Ownership of the system will be transferred to the Thruway Authority after 20 years.

"The Thruway offers MFS secure rights-of-way for the fiber optic cables, and in return the Thruway and New York State will save money for its diverse telecommunications needs," says Steinberg. "It is estimated, for example, that the Authority alone will save in excess of $500,000 annually by using the new network.

"This is a great example of a government entity looking for new and creative ways to generate revenue. These types of partnerships will be the way of the future as agencies learn to do more with less."

Construction and beyond

Construction of the fiber optic network was officially launched in April 1997 with 10 subcontractors installing six fiber optic ducts (each 1.25in in diameter). Each duct is capable of supporting a 96-fiber cable. By the end of 1997, four of the six ducts were leased.



About 700 laborers worked on the system installation. Network maintenance and operations will require another 10 to 20 permanent telecommunications positions.

Almost 4,000 miles of ducts were laid along the Thruway system, the longest

EXHIBIT 3

The AEGIS Group, Ltd.

6387 Kingsview Lane N., Maple Grove 55311 • Phone 612-550-0257 • Fax 612-550-0258

AFFIDAVIT OF
FAZIL BHIMANI

INTRODUCTION

1. My name is Fazil Bhimani. I am President of AEGIS Group, Ltd., a telecommunications consulting firm, located in Maple Grove, MN. My firm is engaged by the State of Minnesota, Department of Administration, and I have been the principal consultant for the State for AEGIS Group, Ltd.

2. I have over twenty years of experience in the computing and telecommunications industry and in Minnesota for the past eight years. I have a Bachelor of Computer Science degree from the University of Minnesota and a Masters in Economics and Finance from Northwestern University.

   I have consulted for over ten years with public entities (multiple states, counties, and cities) and private commercial enterprises. I have worked on projects that range from technology design and deployment to conducting feasibility studies including rights-of-way issues, performing market analysis, developing product plans and roll out, developing rate and pricing models, and providing general business and management consulting.

3. I have reviewed both the opposing and supporting comments filed with the FCC in the matter related to CC Docket 98-1 - The Petition of the State of Minnesota for a Declaratory Ruling Regarding the Effect of Sections 253(a), b, and c of the Telecommunications Act of 1996 on an Agreement to Install Fiber Optic Wholesale Capacity in the State Freeway Rights-of-Way (ROW).

   Analysis presented in affidavits submitted on behalf of parties opposing the motion related to cost advantages enjoyed by the Developer, relevant market definition, alternative rights of way, and cost capacities are either flawed or do not present a complete analysis of the relevant facts specific to the State's Agreement with the Developer.

   WHEN ALL THE COST COMPONENTS ARE INCLUDED IN THE ANALYSIS, THERE IS NO COST ADVANTAGE TO THE DEVELOPER.

4. Mr. Robert Eide in his declaration for MFS states that the Developer would enjoy at least a 30% cost advantage in accessing freeway rights-of-way when compared to others accessing alternative rights-of-way. No facts have been provided to support this claim.

Mr. Ken Knuth who has provided an affidavit in support of Minnesota Telecommunications Association's (MTA) filing, compares just the cost for placing fiber in the rural freeway rights-of-way and the state trunk highway and concludes that placing fiber in the state trunk highway is sixty percent to seventy percent higher. Mr. Knuth focuses on one component of the project cost and he does not include in his analysis cost related facts relevant to the project.

5. The Agreement provides for construction of approximately 1750 miles of fiber as Phase 1 routes, with an option for approximately 290 additional miles (160 miles in rural freeways and 130 miles in metro freeways) as optional Phase 1 routes. Of the 1750 miles of fiber to be laid by the Developer as Phase I routes, approximately 816 miles are on the freeway rights-of-way of which, 226 miles are in metro freeways, and 590 miles are in rural freeway rights-of-way.

If we were to accept Mr. Knuth's cost analysis for the 816 miles of freeway rights-of-way, then by extension, the following table shows what he believes the cost advantage would be for the Developer. The advantage of $3 million needs to be adjusted as discussed further.

Route	Freeway Miles	Cost Advantage
Minneapolis/Fargo	224	$ 777,669
Minneapolis/Duluth	128	$ 525,393
Total for 2 routes	352	$1,303,062
Per mile advantage	-	$3,702
Total freeway advantage	816	$3,010,832

Approximately 226 miles of the 816 miles of freeway rights-of-way are in the metropolitan areas. Mr. Knuth assumes that the cost for laying fiber in the metro area freeway rights-of-way is the same as laying fiber in the rural freeway rights-of-way. Metro area freeway routes are significantly congested and in many cases there are concrete walls on both sides of the freeway and no space is available for fiber deployment. The number of directional borings is significantly higher in the metro freeways due to increased number of interchanges and other obstructions. Construction costs for the metro area freeways are estimated by Stone & Webster engineers to be approximately $100,000 per mile for labor and material. This is similar to cost information I obtained from Brooks Fiber and OCI - carriers who have recently deployed fiber within the metropolitan areas of Minneapolis and St. Paul using alternate rights-of-way, who indicated costs per mile of $100,000. OCI also indicated that their network took less than six months to construct. Based on the above information, no cost advantage exist for the Developer for laying fiber in the metro area freeways.

If we were to adjust the total freeway advantage shown in the table above, to reflect that the Developer will enjoy no cost advantage in the metro area freeway

rights-of-way to lay fiber, we arrive at a number slightly over $2 million as Developer's cost advantage, for the 590 miles of rural freeway rights-of-way as shown below.

Route	Freeway Miles	Cost Advantage
Minneapolis/Fargo	224	$ 777,669
Minneapolis/Duluth	128	$ 525,393
Total for 2 routes	352	$1,303,062
Per mile advantage	-	$3,702
Total rural freeway advantage	590	$2,184,180

The cost advantage is not significant when compared against the total project cost of over $100 million. Even when viewed in context of freeway construction costs only, the alleged savings are a small portion of the total project ($2 million out of over $60 million). This advantage is illusory as further analysis will show.

6. Mr. Knuth in his analysis does not take into account the fact, that the Developer is required by the Agreement to pay prevailing wages for labor when others are not required to do so. Because the State is treating the Agreement similar to a state construction project to meet its ITS and other state telecommunications needs, it subjected the Developer to prevailing wage provision. Based on estimates provided by Stone & Webster and construction contractors, this increases the fiber laying labor cost for the Developer on average by $4,000 per mile for rural freeways. For laying fiber, this results in an increase of approximately $10 million for the project, of which, over $6 million is in rural areas. If the increase in per mile labor cost is applied to Mr. Knuth's estimate of $5,853 for rural freeways, the Developer's per mile cost would be $9,853. The table below summarizes the labor cost disadvantage the Developer faces for the 590 miles of rural freeway. Any perceived advantage disappears when the prevailing wage aspect of the contract is included in the analysis.

Cost per mile for rural freeway per Mr. Knuth's analysis	$5,853
Developer's cost using Mr. Knuth's analysis and prevailing wage premium.	$9,853
Per mile increase for the Developer (See Note below)	($4,000)
Advantage for 590 miles from previous table	$2,184,180
Increase in Developer's cost for 590 miles	($2,360,000)
Net increase in cost for the 590 miles of rural freeways (See Note below)	($175,820)

Note: The Developer faces prevailing wage differential for the non-freeway rights-of-way which has not been included in the dollar amount shown.

Should the Developer exercise the option to lay fiber on the 290 miles of optional Phase 1 routes where approximately 130 miles are in the Twin Cities metropolitan

freeway rights-of-way, and 160 miles on rural freeways, a similar analysis will show that no cost advantage accrue to the Developer when laying fiber on these routes.

7. If the cost analysis is done using the Developer's average per mile cost for rural freeway rights-of-way (estimated at $25,000/mile) and rural non-freeway rights-of-way (estimated at $28,500/mile), the following cost differential is obtained:

Differential of $3,500/mile x 590 miles	-	$2,065,000
Plus 59 miles (10% of 590) @$28,500/mile	-	$1,681,500
Total differential using Developer's cost	-	$3,746,500

The Developer's per mile cost differential of 14% between rural freeways and rural non-freeways is consistent with other experiences (see below). Given the higher cost structure of the Developer (e.g. use of prevailing wage), the construction cost for freeway rights-of-way is higher than the cost incurred by others on non-freeway rights-of-way who are not subject to the prevailing wage requirement. The cost of $100,000 per mile for metro area freeway rights-of-way remains the same for this analysis conferring no cost advantage for metropolitan freeways.

The analysis above is supported by earlier studies that have shown that the cost of installed fiber-optics infrastructure varies by location. A study done by Hess (See Attachment A) shows that the cost for installing fiber infrastructure on freeway rights-of-way near the freeway fence line (as required by the Agreement) is lower by 11% to 21% when compared against other rights of way (e.g. non-interstate highways, private land, railroads). When prevailing wage impact is factored in to the costs presented by the study, this advantage disappears.

8. New entrants such as Brooks Fiber, OCI, Qwest and others are not obligated to and generally do not pay prevailing wages. For example, Brooks utilized Fischel Co., to place its fiber rather than prevailing wage firms.

9. Mr. Eide declares that the Developer will have a lower rights-of-way acquisition cost and ongoing maintenance cost because of access to the freeway rights-of-way. He provides no factual support for this statement. Mr. Eide ignores the one time cost and increase in ongoing recurring cost that the Developer will incur as a result of accessing the freeway rights-of-way. These include:

   a) Labor cost differential for the rural freeway and rural non-freeway portion of the construction due to prevailing wage requirement.
   b) Provision of equipment and fiber construction (up to $5 million) to connect the existing Department of Transportation's ITS infrastructure.

c) Capacity provided to the State for use by DOT and other agencies and its ongoing maintenance.
d) Requirement to provide fiber capacity to less populous rural areas of Minnesota using non-freeway rights-of-way.

If these costs are considered, Mr. Eide will find that the cost that the Developer incurs will be similar to others using alternate rights-of-way.

10. When all the facts of the Agreement and the project are reviewed and properly analyzed, it is clear that the Developer does not enjoy any material cost advantages. Analysis presented by Mr. Knuth and others have not included:

a) Higher cost for laying fiber in the metro area freeways.
b) Provision to pay prevailing wages for labor.
c) Increased one time and recurring costs to deploy fiber on non-freeway rights-of-way in rural Minnesota and to provide capacity to the State.

The Developer has paid a fair price for accessing the freeway rights-of-way, the Developer has no cost advantage, and will enjoy no market power due to any cost advantages.

FIBER SYSTEMS WHILE DIFFERENT, DO REQUIRE SPACE AND MAINTENANCE, AND REPAIR ACTIVITIES CANNOT BE PRE-SCHEDULED AS SUGGESTED.

11. The affidavit submitted by Strategic Policy Research (SPR) on behalf of MTA describes fiber optic systems with amplifiers as very different than previous systems of copper and coax with amplifiers and that fiber need " only to be dropped into a narrow trench along the edge of right-of-way". While acknowledging that fiber systems are different and that fewer amplifiers are needed as compared to copper cabling - one cannot ignore the fact that multiple fiber cables placed at different times or at the same time by multiple entities would require multiple "narrow trenches" with some separation between the trenches. Multiple trenches create a significant burden of management for the Department of Transportation. Freeway or interchange reconstruction project costs and schedules are impacted significantly when coordination for relocation involves multiple entities. Multiple trenches would create a higher level of risk for public safety, particularly, in congested metro area freeways where creating a single fiber trench is difficult. Providing collocation access to the freeway rights-of-way through a single entity minimizes public safety risk, reduces rights-of-way management burden, and enhances competition by allowing additional fiber capacity to come to market.

12. Despite technical advances, fiber systems do require maintenance. While SPR states in their affidavit that it is reasonable to provide access to freeway right-of-

way on a scheduled basis to meet State's responsibilities of public safety, they fail to acknowledge that repair activities cannot be pre-scheduled. If multiple entities are allowed in the freeway rights-of-way, a fiber cut is very likely to impact all the fiber located at a particular location resulting in multiple entities wanting access to the same general area at the same time for repairs - a scenario that greatly increases the risk to public safety. Managing access to freeway rights-of-way for maintenance by a single party during winter months and during periods of adverse weather condition is challenging enough let alone allowing multiple entities access for repair activities.

THE RELEVANT MARKET FOR FIBER CAPACITY IS THE STATE OF MINNESOTA. THE STATE HAS SHOWN THAT ALTERNATIVE RIGHTS-OF-WAY EXIST, THAT THERE IS SUFFICIENT FIBER CAPACITY IN MINNESOTA TODAY, AND CAPACITY CAN BE EXPANDED IN FUTURE WITH MINIMAL INVESTMENT. THESE FACTS PROVIDE ASSURANCE THAT NO MARKET POWER POTENTIAL EXIST FOR THE DEVELOPER

13. SPR in their affidavit disagrees with the State's petition that the relevant market for the wholesale fiber capacity is the State of Minnesota. A joint filing by the United States Telephone Association, Western Rural Telephone Association, Organization for the Promotion and Advancement of Small Telephone Companies, and Competition Policy Institute opposing the State's petition asserts that the relevant geographic market is the State of Minnesota (See footnote 37). While the physical fiber may be location specific, the capacity may be used to connect locations not physically on the freeway routes. Similarly, transmission facilities (wireline and wireless) not on the freeway right-of-way can and do provide capacity between locations connected by the freeways. Swap agreements between carriers make it possible to trade capacity between locations. As such, the fiber capacity being deployed should be viewed in the context of the entire State of Minnesota. It should be emphasized that points served by the freeway system are also served by alternative rights-of-way (See Exhibits 9 through 17 of State's Petition) including state and county trunk highways.

14. The assertion by SPR that the State has not provided evidence that alternative facilities exist now or may exist in ten years is not accurate.

    a) Attachment B depicts the freeway rights-of-way with an overlay of MEANS (a company owned by approximately 65 local independent telephone companies) fiber network. It shows that the fiber network essentially parallels the freeway rights-of way and connect the same major points served by the freeway.
    b) Attachment C shows an overlay of the freeway and fiber facilities within the State of Minnesota. It shows fiber facilities connecting points across the state.

c) Mr. Knuth's affidavit provides additional evidence that there are fiber facilities of interexchange carriers Sprint and AT&T going between Minneapolis to Fargo, Plymouth to St. Cloud, St. Paul to Des Moines.

d) AT&T has physical points of presence (POP) in all the major population centers in Minnesota. These include: Duluth, Moorhead/Fargo, Wadena, St. Cloud, Mankato, Rochester, and Twin Cities. These POPs are connected by fiber facilities using non-freeway rights-of-way (except for the segment between Plymouth and St. Cloud).

e) MCI has fiber facilities in the state that use trunk highways and railroad rights-of-way that cut across southwestern and central Minnesota connecting Marshall to the Twin Cities.

f) Sprint and WorldCom have fiber facilities connecting Minneapolis/St. Paul, Rochester, Fargo/Moorhead, St. Cloud, and Owatonna.

g) US Link fiber network utilizes non-freeway rights-of-way to connect Duluth, Hibbing, Brainerd, Wadena, St. Cloud, and Minneapolis - some of which are on freeway routes.

h) Dakota Telecommunications is deploying fiber in the southwestern part of Minnesota using state trunk. The fiber is planned to connect the cities of Marshall, Worthington, Pipestone, Luverne, Slayton., and Sioux Falls (SD) where part of the route will parallel interstate freeway.

Attachment D provides a synopsis of long haul routes paralleling the freeway system. There are additional fiber routes being deployed (e.g. Dakota Telecommunications) that are not shown on the attachment.

In many cities, CLECs have deployed or are in the process of deploying fiber facilities.

a) Brooks Fiber and OCI have deployed fiber around the Twin Cities metro area that connect significantly the same points as the metro freeway does.

b) Fiber facilities have also been deployed or is currently being deployed in the cities of St. Cloud, Morris, Brainerd, and Fergus Falls by CLECs (E.Otter Tail, Infotel, Federated, Park Region, Lakedale).

Other entrants such as Qwest, Digital Teleport, Inc., Mcleod U.S.A., Minnesota Power and Light, Cooperative Power Association and United Power Association (CPA-UPA) are deploying fiber or have plans to deploy fiber in Minnesota using alternate rights-of-way. New entrants and incumbent telephone companies operating as CLECs have construction or business plans to deploy fiber facilities

in Minnesota towns of Bemidji, Wilmar, Detroit Lakes, Faribault, Fairmont, Northfield, and Owatonna. Combined, these facilities parallel a significant portion of the freeway to which the Developer has been granted one time access.

As demonstrated by the above facts and attachments, there is ample evidence that alternative facilities exist now and will exist in the future.

15. SPR's assertion that the freeway system represents the most direct and least cost route among the major cities is not entirely correct. While the freeways generally provide a direct route, it may not be the least cost way to provide capacity to the major cities. It is incorrect to conclude that if demand were to increase substantially between two major cities connected by the freeway that the providers would look to bury new fiber between the two points using the freeway. As the Exhibits in the State's Petition show, major cities are already connected by fiber facilities. MTA in their testimony to the legislature has stated that over 20,000 miles of fiber exist in the State. Exhibit 10 in the State's Petiton further shows that approximately 85% of the fiber in the State of Minnesota is dark - providing a base for tremendous increase in future capacity if demand warrants. In most cases, it would be less costly to increase capacity by deploying newer fiber optics electronics or upgrading existing electronics to higher capacity electronics than by plowing more fiber no matter how direct a route may be between the two points.

The following two tables compare cost estimates for increasing capacity between two points by using electronics versus deploying additional fiber. Costs shown are list prices. Table 1 shows the cost for upgrading capacity by increasing the speed of transmission by using what is known as time division multiplexing.

Table 1 - Capacity Upgrade Cost Using Timing Division Multiplexing Technology

Option (See Note 1)	50 miles	150 miles	250 miles
Provide OC12 capacity using existing dark fiber	$90,000	$170,000	$250,000
Provide OC48 capacity using existing dark fiber	$260,000	$440,000	$620,000
Provide OC192 capacity using existing dark fiber	$650,000	$1,100,000	$1,550,000
Deploy fiber in rural area @$27,000/mile (See Notes 2,3)	$1,350,000	$3,950,000	$6,750,000
Deploy fiber in metro area @100,000/mile (See Note 3)	$5,000,000	$15,000,000	$25,000,000

Note 1: Equipment cost estimate provided by Lucent Technologies and Fujitsu.
Note 2: Cost averaged for rural and non-rural freeway using 48 strand standard fiber.
Note 3: Electronics cost to light fiber is additional.

As can be seen from the table above, using time division technology, capacity can be upgraded four fold (OC12 to OC48) at a fraction of the cost for deploying new fiber.

Capacity can further be increased by using dense wave division multiplexing (DVDM) technology. This technology uses different colors to create separate transmission channel on the same fiber strand. Each channel is then available for transmission as if it was a separate fiber. Table 2 provides cost estimate for increasing fiber capacity using DVDM.

Table 2 - Capacity Upgrade Cost Using Dense Wave Division Multiplexing

Option (See Note)	50 miles	150 miles	250 miles
Provide two color channel	$618,000	$944,000	$1,107,000
Provide four color channel	$1,236,000	$1,562,000	$1,725,000
Provide sixteen color channel	$2,260,000	$2,586,000	$2,749,000
Provide forty color channel	$3,384,000	$3,750,000	$3,935,000

Note: Assumes OC-48 transmission per color channel. Equipment cost estimate provided by Ciena Corporation and Alcatel. It is expected that technologies will be available in the next two to three years that can provide ninety-six color channels.

As seen from the above table, for less than the cost of deploying new fiber, capacity of existing fiber can be increased many fold using DVDM.

Currently, time division multiplexing and DVDM technologies can be used together to increase capacity of one pair of fiber stand one hundred and sixty fold (OC12 to OC48 times 40 colors), with four hundred fold increase achievable within the the next two to three years.

16. The above facts show that, the Developer has no market power, and cannot exert market power in the future.

    a) Alternativee rights-of-way exist and locations connected via freeway are currently connected via fiber facilities.

    b) Existing fiber infrastructure, and the ongoing fiber deployment in the State of Minnesota provides capacity today, and the potential to expand capacity dramatically at incremental cost using existing technologies.

    c) Current developments in fiber electronics by Ciena Corporation, Lucent Technologies, and others will have the capability to increase fiber capacity almost one hundred fold for less cost than deploying new fiber. These developments are projected to reach the market over the next two to three years.

EXPERIENCE IN OTHER STATES SHOW THAT THERE IS NO INHIBITION TO ENTRY BY FUTURE PROVIDERS, AND THE STATE'S APPROACH TO ALLOWING A SINGLE ENTITY TO PERFORM MAINTENANCE IS CONSISTENT WITH THE INDUSTRY PRACTICE.

17. SPR speculates that the contract "is likely to inhibit the entry of future providers." No facts have been presented to support this claim. Experience in other states does not support this claim. New facilities based providers have entered the telecommunications market subsequent to an exclusive award by the State of Missouri to Digital Teleport, Inc. (DTI). Qwest has deployed fiber facility across the State of Missouri, paralleling the freeway rights-of-way, Brooks Fiber has entered the Kansas City and St. Louis metro areas, and Sprint is deploying fiber around Jefferson City. The Williams Company has plans to build fiber across the State of Missouri.

18. SPR's affidavit states that the Developer may engage in anti-competitive behavior because the Agreement does not require the Developer to disclose technical information or to notify others of technical changes. Furthermore, the Agreement does not provide a check to assure that the Developer does not favor its own retail affiliate in the restoration of service.

These statements assume that the carriers and providers opting to collocate fiber or procure wholesale capacity from the Developer are either naive or have no experience in procuring or selling capacity. The carriers are much more intelligent than SPR credits them.

The Developer is required to collocate users on a non-discriminatory basis. Collocating customers have the option of providing their own fiber and electronics. The Agreement does not require that the collocating customer procure their fiber and electronics from the Developer. Any arrangement between the Developer and the collocating customer is an agreement reached among the two parties without the Agreement imposing any terms. Concerns were raised about affiliate abuse or quality of service abuse due to single entity maintenance arrangement. Yet, in the case of State of New York Toll Authority project where Qwest has recently utilized MFS installed conduit and WorldCom (parent of MFS) and fONOROLA has purchased or plans to purchase capacity from MFS, no concerns has been expressed about affiliate abuse or gatekeeper abuse.

19. The Agreement requires that the Developer provide wholesale fiber capacity on a non-discriminatory basis. Buying and selling of wholesale capacity is a normal business activity in the telecommunications industry. Carriers swap capacity, purchase capacity from each other or third parties on a regular basis. Generally, these purchases are done via contracts that include quality of service parameters besides pricing and term arrangements. A carrier swapping capacity or purchasing capacity from another provider does not insist that they also have access to the sellers facilities for maintenance. No carrier (IXC, LEC, or CLEC)

allows another carrier to maintain its facility even though they may purchase wholesale capacity from each other.

The State's Agreement limiting maintenance activity to a single entity for public safety reasons is consistent with the industry practice of facility maintenance by a single carrier.

SUMMARY OF ANALYSIS

20. In summary, the facts show that:

a) No cost advantage exists for the Developer when all the benefits and costs are analyzed.

b) Fiber systems, while different, do require space and maintenance. The State's approach to using a single entity to provide fiber capacity and allowing collocation minimizes public safety risks while at the same time enhancing competition.

c) The State of Minnesota is the relevant market for the fiber capacity. Alternativee rights-of-way exist and multiple fiber facilities exist today that parallel the freeway rights-of-way. Ample fiber capacity exist today and the potential is there to increase capacity tremendously with minimal cost using todays technologies.

d) Experience in other states shows that the Agreement will not inhibit future entries in the telecommunications market and that the State's approach to maintenance is consistent with the industry practice of a single vendor maintaining facilities in a single trench.

These facts are sufficient to show that competitive forces will not allow the Developer to exert market power along the freeway rights-of-way.

Signed Fazil Bhimani Date April 8, 1998

Fazil Bhimani

Subscribed and sworn to before me on

The 8th Day of April, 1998

Cheryl L. Boe

NOTARY PUBLIC

CHERYL L. BOE
NOTARY PUBLIC-MINNESOTA
HENNEPIN COUNTY
MY COMMISSION EXPIRES JANUARY 31, 2000

Attachment A

- Highway right-of-way values inferred by Hess et al. (1988), using a next best alternative approach.
- Lease rates charged by independent authorities (toll and turnpike), and
- Shared resource agreements recently negotiated by state and local agencies.

Next Best Alternative

Hess et al. (1988) inferred the value of highway right-of-way by comparing fiber-optics installation costs in roadways and on railroad right-of-way and private land. The authors collected information on installation costs from six telecommunications companies as well as engineering firms and cable manufacturers. They documented costs in five categories-engineering, right-of-way acquisition, cable procurement, cable installation (placement, splicing, etc.), and regenerator procurement-and took into account differences in cost according to location in interstate freeways, non-interstate highways, railroads, and private land. Cost data, even within a type of right-of-way, showed wide variation; thus the results are very dependent on the specific values selected by the authors from the ranges of values.

The table below indicates possible values for roadway right-of-way based on comparisons among locations. Caution is advised in using these values, not only because they are based on 1988 data and exclude installation of conduits now more commonly used but also because they are based on representative values, which may or may not be valid in individual cases.

Costs of Installed Fiber-optics Infrastructure by Location

	Interstate Highway[a]		Non-Interstate Highway[a]	Private Land[b]	Railroad[c]
	Median	*Fence Line*			
Total Installed Cost (one-time, $000 per mile)	$44.8	$50.8	$61.8	$57.8	$56.8
Compared with Interstate Median	-	+6.0	+17.0	+13.0	+12.0
Compared with Interstate Fence Line	-6.0	-	+11.0	+7.0	+6.0

Notes:

[a] *excludes* land acquisition costs.

[b] *includes* land acquisition costs of $1,000 per linear mile of right-of-way.

[c] *includes* one-time acquisition costs of $12,000 per mile.

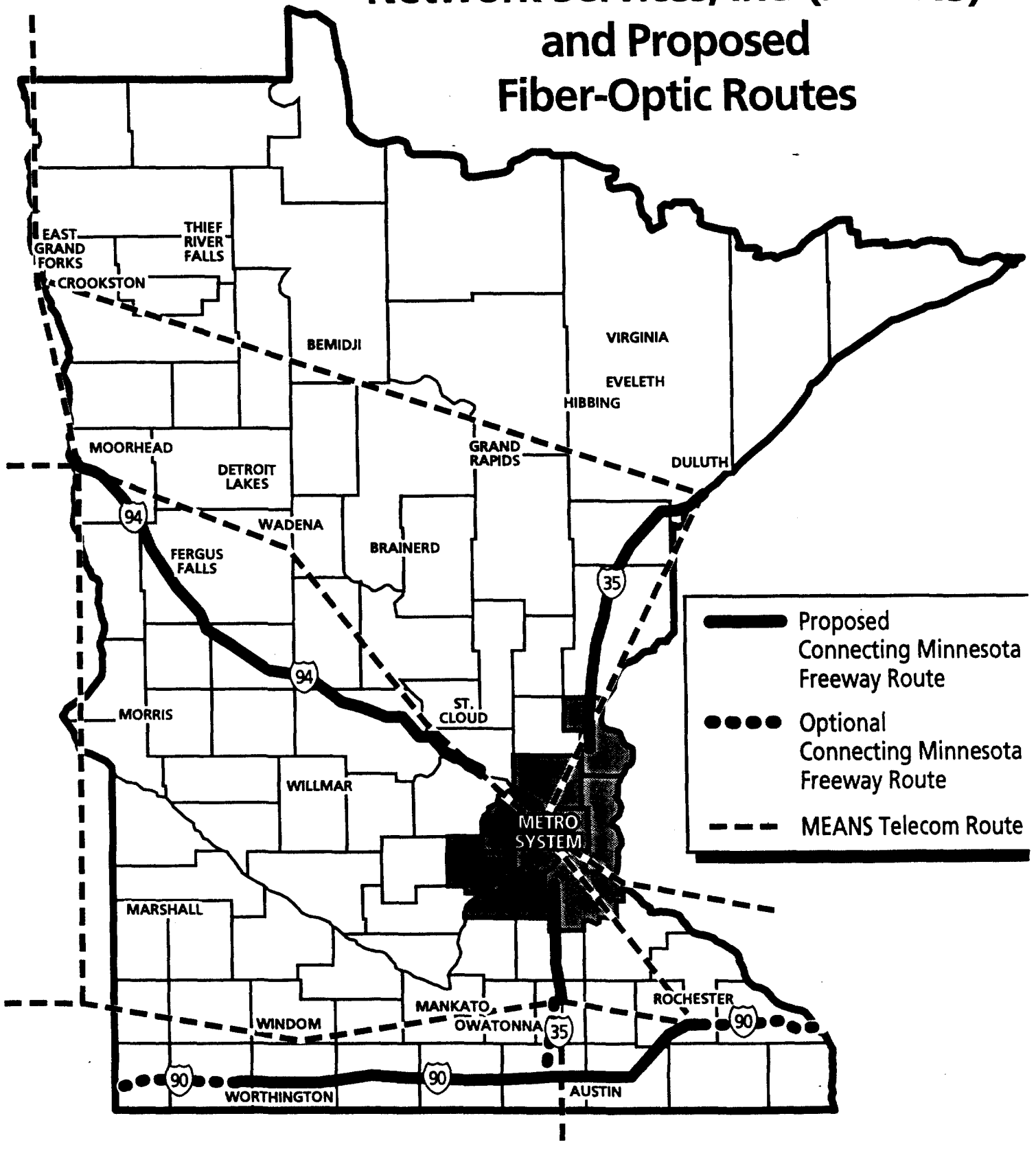
According to this set of computations, longitudinal access to interstate highway right-of-way median could be worth a $12,000 one-time payment if the next best alternative were a railroad right-of-way. On the other hand, location in a non-interstate right-of-way may present no advantages over the next best alternative unless that alternative is private land and transactions costs (not considered here) amount to more than $4,000 per linear mile (that is, the difference between installed costs of $61,800 on a non-interstate exclusive of lease costs and $57,800 on private land including purchase or easement costs).

Rates Charged for Longitudinal Access to Right-of-way

Although most shared resource agreements negotiated by state DOTs involve in-kind compensation, independent tollroad and thruway authorities and at least one state DOT have histories of cash compensation that provide empirical data on right-of-way values. The following table presents an updated and somewhat expanded version of the data presented by Hess et al. (1988) on costs of accessing highway and aqueduct rights-of-way. It is clear that there is a significant variation in fees that cannot be explained solely in terms of location within the right-of-way or urban/rural context. These differences are (presumably) attributable to region of the country (and associated variations in land values), competitive conditions such as the proximity and characteristics of the next best alternative, and bargaining strength of the contractual parties involved, as well as market needs of the lessees involved.

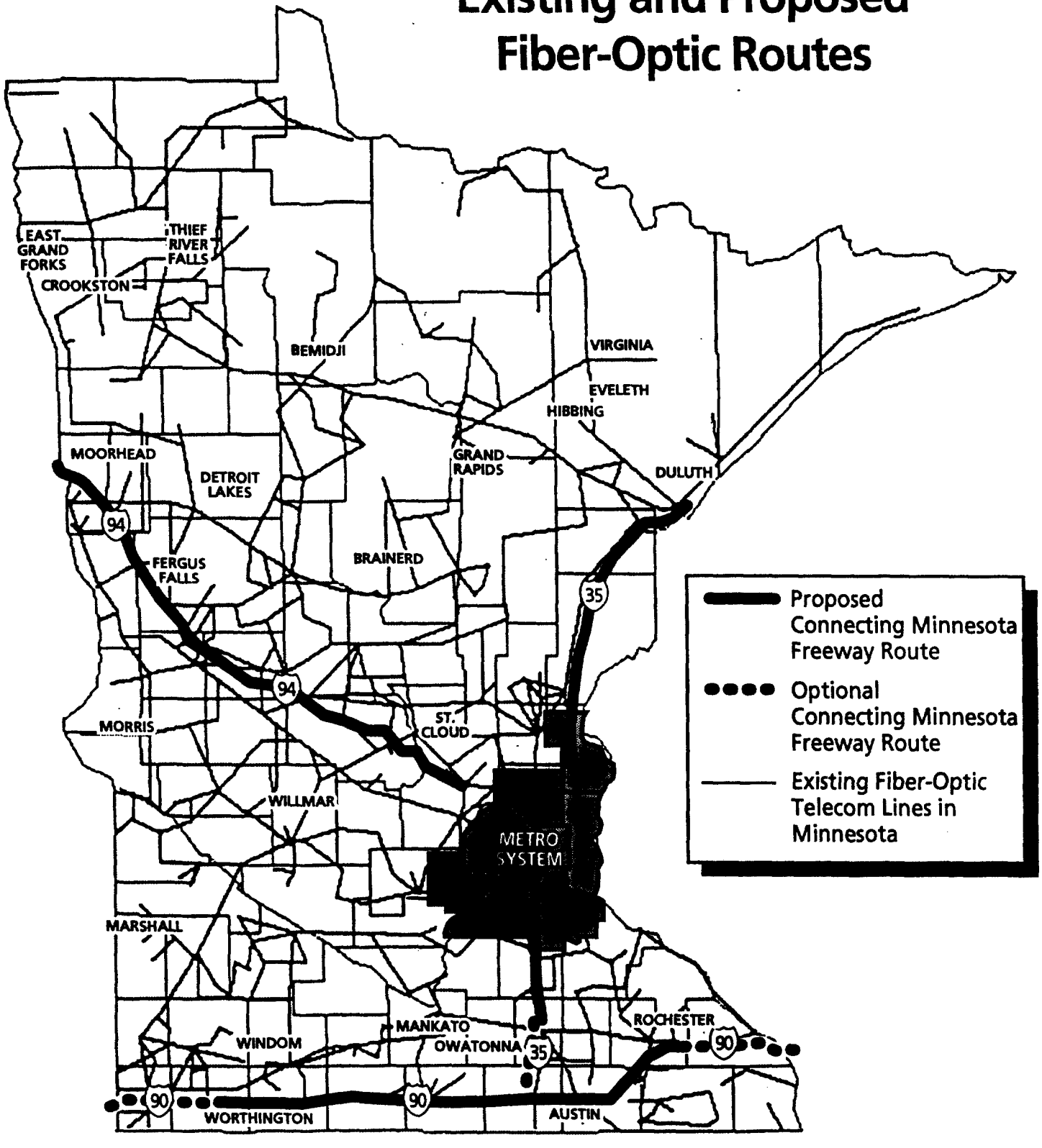
Attachment B

Minnesota Equal Access Network Services, Inc. (MEANS) and Proposed Fiber-Optic Routes



Attachment C

Existing and Proposed Fiber-Optic Routes



Attachment D

FIBEROPTIC LONG-HAUL SYSTEMS IN MINNESOTA

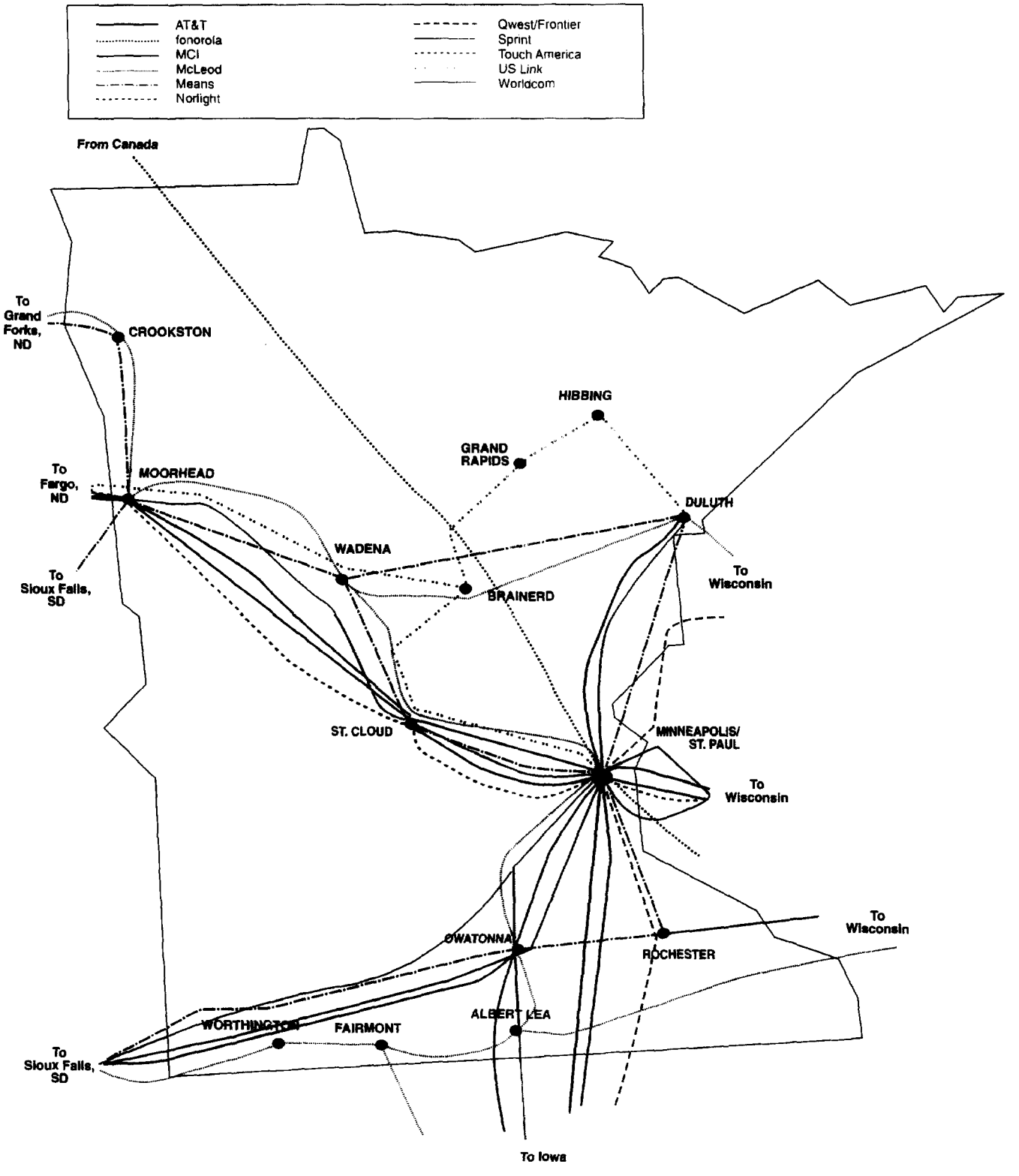


EXHIBIT 4

INFORMATION AGE ECONOMICS, INC.
4530 DEXTER ST., NW | WASHINGTON, DC | 20007
202 466 2654 PHONE | 202 338 7390 FAX

AFFIDAVIT OF ALAN PEARCE

INTRODUCTION

1. My name is Alan Pearce. I am President of Information Age Economics (IAE) Inc., a Washington D.C. - based research and consulting company located at 4530 Dexter Street, N.W., Washington D.C. 20007-1115. The company is 20 years old and has served a variety of domestic and international clients in the telecommunications-information-entertainment (T-I-E) industry.

2. I have more than 30 years experience in the industry, dating back to the mid-1960s. I have bachelor's and master's degrees in economics from The London School of Economics and Political Science, University of London, and a Ph.D. in Business and Telecommunications from Indiana University. Prior to coming to the United States in 1968, I worked for four years as a newspaper and television journalist in London. In 1970, after completing the course requirements for my Ph.D., I began work at the Federal Communications Commission (FCC) in Washington D.C., serving first as a consultant, then as a special assistant and finally Chief Economist for Chairman Dean Burch and, later, Chairman Richard E. Wiley. I left the FCC at the end of 1974 and became chief economist for what was then the House of Representatives Subcommittee on Communications. In the spring of 1977 I moved to the Office of Telecommunications Policy in the Executive Office of the President where I served as Chief Economist and Senior Policy Adviser. In March 1978, I left the U.S. government and founded IAE.

3. Over the past 20 years, I have assisted major industry players in mergers and acquisitions; assisted national governments as they privatize and regulate their incumbent telecommunications operators; and supported a wide and diverse group of clients with position papers, research, and testimony before the FCC, the U.S. Congress, the Department of Justice, State regulators, Federal District Courts, taxing authorities, and foreign governments. My clients over the past few years have included AirTouch, Alcatel, Andersen Consulting, Bell Communications Research, British Telecom, Cellular Linking, the Cellular Telecommunications Industry Association, the Ciena Corporation, Computer Sciences Corporation, Coop City, Excell Agent Services, Ernst & Young, the European Union (D.G.13), Korea Telecom, Nortel, Optus of Australia, PCS Primeco, the Sandia National Laboratories, Silicon Wireless, the University of Southern California, and Viacom-Paramount.

4. The Minnesota Department of Transportation and Administration has retained me to assist in the preparation of reply comments in CC Docket 98-1, Petition of the State of

Minnesota for a Declaratory Ruling Regarding the Effect of Section 253 of the Telecommunications Act of 1996 on a Agreement to Install Optic Wholesale Capacity on State Freeway Rights-of-Way (ROW).

SUMMARY OF STATE'S EFFORTS TO COMPLY WITH SECTION 253

5. I have reviewed the comments of the various parties and become familiar with Section 253 and the Commission's goal to remove barriers to entry created by state or local laws or requirements. In my opinion, the State has expressed legitimate public safety and rights-of-way management objectives in requiring that a single entity perform one time construction on the freeway rights-of-way. I then reviewed the allegations that any form of exclusivity creates a significant and material barrier to entry in the context of the relevant market. This analysis leads me to conclude that the practical impact on competition will be positive and that the State has appropriately balanced the pro-competitive objectives of the Telecommunications Act of 1996 with the rights reserved to it to protect public safety and manage these most important freeway rights-of-way.

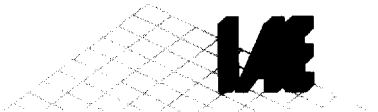
RIGHTS-OF-WAY: AN OVERVIEW

6. It is helpful to begin with an overview of supply and demand of rights-of-way in order to put the criticism of the project in the appropriate perspective.

Rights-of-way provided the foundation of the earliest nationwide telecommunications service, namely the telegraph, in the 19th century. From the very beginning, rights-of-way have been made available by a variety of entities. Today, there are at least seven providers of rights-of-way that serve the telecommunications-information-entertainment (T-I-E) industry in the United States.

a) Municipal Streets, both above and below the ground.
b) Railroads, which greatly assisted in the provision of nationwide telegraphy in the last century.
c) Electric Utilities.
d) Federal and State Highways and Freeways; Toll Roads and Turnpikes; and other roads.
e) Waterways, both canals and rivers.
f) Pipelines, both oil and gas.
g) Private Property.

7. Historically, longitudinal placement of utilities on freeways were prohibited by the Federal Highway Administration. This ban was predicated on the concerns for public safety and convenience of the traveling public. Thus freeway rights-of-way are not a traditional source of supply and it has not been until the 1990s that any states began considering longitudinal placement of freeway facilities.



8. Rights-of-way are demanded by various entities in the T-I-E industry, namely:

a) Incumbent Telephone Companies such as the five Regional Bells (Ameritech, Bell Atlantic-Nynex, BellSouth, SBCC-Pacific Telesis, and US WEST), plus GTE and a large number of independent telephone companies.

b) Competitive Local Exchange Carriers (CLECs) such as Metropolitan Fiber Systems (MFS) and Brooks Fiber, now incorporated into WorldCom which will become a part of WorldCom-MCI, subject to FCC, Department of Justice, and European Union approval; Teleport Communications Group (TCG), recently acquired by AT&T; and others.

c) The Interexchange Carriers (IXCs) which include some of the world's largest telecommunications companies, for example, AT&T, which is linked with at least two consortia - one serving Europe and another serving Asia; WorldCom-MCI-MFS-Brooks-UUNET, which is in the process of being combined into a single global entity (see above); Sprint, which is partially owned by Deutsche Telekom and France Telecom, Europe's first and second largest telecommunications companies (Sprint also has wireless ventures with several of the largest cable TV, entertainment, and publishing conglomerates); Qwest and LCI, which are being merged into one company, et al.

d) Cable TV Companies, for example TCI, Time Warner, Comcast, Cox, MediaOne (which is currently affiliated with US WEST), and others. These, the nation's largest and dominant cable TV companies, also generally have movie and program production interests, publishing and recording affiliates, radio and TV properties, and even satellite distribution channels.

e) Utility Companies that not only own rights-of-way but often use them not only for their internal communications systems but also for the provision of competitive telecommunications services.

f) Railroads such as Southern Pacific, which have staked out major interests in both the provision of telecommunications services and in the sale of rights-of-way.

g) The National Pipeline Companies like the Williams Company of Tulsa, OK, which has a telecommunications subsidiary, Williams Communications; Enron of Houston, TX; and others. Pipeline companies have rights-of-way in Minnesota. Lakehead Pipe Line Co., of Minnesota, has been expanding its rights-of-way ownership in the midwestern states, including Wisconsin and Illinois.